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RESEARCH ARTICLE

Two new species of *Polana* (*Hobemanella*) (Hemiptera: Cicadellidae: Gyponini) and key to species

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ABSTRACT. Two new species of *Polana (Hobemanella)* Mckamey, 2006 are described and illustrated from Brazil: *Polana (H.) alvarengai* **sp. nov.**, from the states of Mato Grosso, Rondônia and Pará, which can be recognized by the aedeagal shaft with subapical group of eight spine-like processes on each side of shaft, on ventral surface; and *Polana (H.) arcana* **sp. nov.**, from the state of Paraná, which can be recognized by the aedeagus with pair of elongated processes arising at base, almost as long as shaft length and parallel to shaft. A key to the 19 known species of *Polana* (*Hobemanella*) is presented.

KEY WORDS. Auchenorrhyncha, *Bohemanella*, leafhoppers, Neotropical Region.

INTRODUCTION

Gyponini is the largest tribe of Iassinae, including 1,381 species in 64 genera (Gonçalves et al. 2015, Freytag 2015, Domahovski and Cavichioli 2017). *Polana* is the third largest genus of Gyponini and has a wide distribution, from southern United States of America to Argentina. Recently six new species of *Polana* (*Varpulana*) have described (Domahovski and Cavichioli 2017). As a result, *Polana* now comprises 153 species in 11 subgenera: *Angusana* (1 species); *Bulbusana* (18 species); *Declivella* (1 species); *Hobemanella* (17 species); *Nihilana* (25 species); *Polana* (34 species); *Polanana* (28 species); *Polanella* (4 species); *Striapona* (1 species); *Validapona* (1 species); and *Varpulana* (11 species).

Polana was described by DeLong (1942) with *Polana quadrinotata* (Spångberg, 1878) as the type-species. *Polana* was characterized by DeLong and Freytag (1972) as follows: "small ovate brown species, 6 to 9 mm long, usually with few markings, with broad forewings that have few irregular reticulations. Crown short and broad, rounded to front. Ocelli about equidistant between eyes and median line and near anterior portion of crown". The subgenus *Bohemanella* was described by DeLong and Freytag (1972) to include *Gypona bohemani* Stål, 1864, designated as type-species, and 13 new species. However, McKamey (2006) renamed the subgenus *Bohemanella* as *Hobemanella* because the former was preoccupied. DeLong (1979a, b) described two new species, *Polana luteonota* and *Polana putara*, which were included in the subgenus. The last contribution on *Hobemanella* was made by DeLong (1984), with the description of a new species, *Polana belema*.

The subgenus was characterized by DeLong and Freytag (1972) as follows: "Head and crown as in the subgenus *Polana*. Male aedeagus greatly recurved, with a pair of parameres [here treated as atrial processes] arising from apex of phallobase. Pygofer with or without dorsal processes; when present, variable in structure".

In this paper two new species are described and a key to the 19 known species of *Hobemanella* is provided. One paratype male of *P. (H.) alvarengai* sp. nov., from Sinop, Mato Grosso, deposited at DZUP, is parasitized with Strepsiptera. The first record about parasitism by Strepsiptera in the tribe Gyponini was made by Remes-Lenicov and Tèson (1975) with *Membracixenos placula* Ball, 1975 on *Curtara pagina* DeLong & Freytag, 1976, and now this is the first record in *Polana*.

MATERIAL AND METHODS

The specimens examined in this study are deposited at the Coleção Entomológica Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba (DZUP), Coleção Entomológica Prof. José Alfredo Pinheiro Dutra, Departamento de Zoologia, Instituto de Biologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, (DZRJ), Museu de Zoologia da Universidade de São Paulo, São Paulo (MZUSP), and Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro (MNRJ). The terminology follows mainly Young (1968,

1977), except for head features (Hamilton 1981, Mejdalani 1998), wings (Dietrich 2005) and leg chaetotaxy (Rakitov 1997). The techniques used for dissection of the male genitalia follow Oman (1949), with a few modifications described by Cavichioli and Takiya (2012). Label data are given between quotation marks, with a backslash (\) separating the lines on the labels and a semicolon separating the labels attached to the same specimen. Square brackets ([ ]) were used to supplement abbreviated information.

TAXONOMY

Polana (*Hobemanella*) McKamey, 2006

Polana (*Bohemanella*) DeLong & Freytag, 1972

Type-species. *Gypona bohemani* Stål, 1894

Diagnosis. Small size, 6.0 to 9.0 mm. Head, in dorsal view, not produced, median length of crown approximately one-third of interocular width; anterior margin of crown broadly rounded and parallel to anterior margin of pronotum; transocular width of head slightly narrower than maximum pronotum width. Ocelli equidistant between eyes and median line, located near anterior margin of crown. Head, in lateral view, with crown-face transition rounded and with several parallel striae. Pronotum moderately declivous; head and pronotum in continuous slope. Male pygofer with or without dorsal processes; when present, variable in morphology. Aedeagus with atrial processes; shaft commonly greatly recurved near base.

Species of *Polana* (*Hobemanella*)
alia DeLong & Freytag, 1972: 247. Peru.
alvarengai sp. nov. Brazil: Mato Grosso, Rondônia and Pará.
arcana sp. nov. Brazil: Paraná.
ardua DeLong & Freytag, 1972: 253. Paraguay.
assula DeLong & Freytag, 1972: 249. Peru.
belema DeLong, 1984: 45. Brazil: Pará.
bohemani (Stål), 1864: 81 (*Gypona*). Bolivia, Brazil, British Guiana, Colombia, Costa Rica, French Guiana, Mexico, Guatemala, Panama and Peru.
praeterita (Fowler), 1903: 304 (*Gypona*).
draba Evans, 1947: 256.
celsa DeLong & Freytag, 1972: 250. Bolivia.
chelata DeLong & Freytag, 1972: 244. Peru.
chifama DeLong & Freytag, 1972: 250. Brazil: Mato Grosso.
elabora DeLong & Freytag, 1972: 252. Peru.
luteonota DeLong, 1979a: 154. Bolivia.
macula DeLong & Freytag, 1972: 252. Bolivia.
orbita DeLong & Freytag, 1972: 252. Bolivia and Paraguay.
putara DeLong, 1979b: 298. Bolivia.
resilara DeLong & Freytag, 1972: 249. Peru.
resupina DeLong & Freytag, 1972: 244. Bolivia, Peru and Venezuela.
retenta DeLong & Freytag, 1972: 247. Venezuela.
scela DeLong & Freytag, 1972: 253. Peru.

Polana (*Hobemanella*) *alvarengai* sp. nov.

http://zoobank.org/B9DCF6A7-4086-428C-8186-29056EEC4785
Figs 1–14

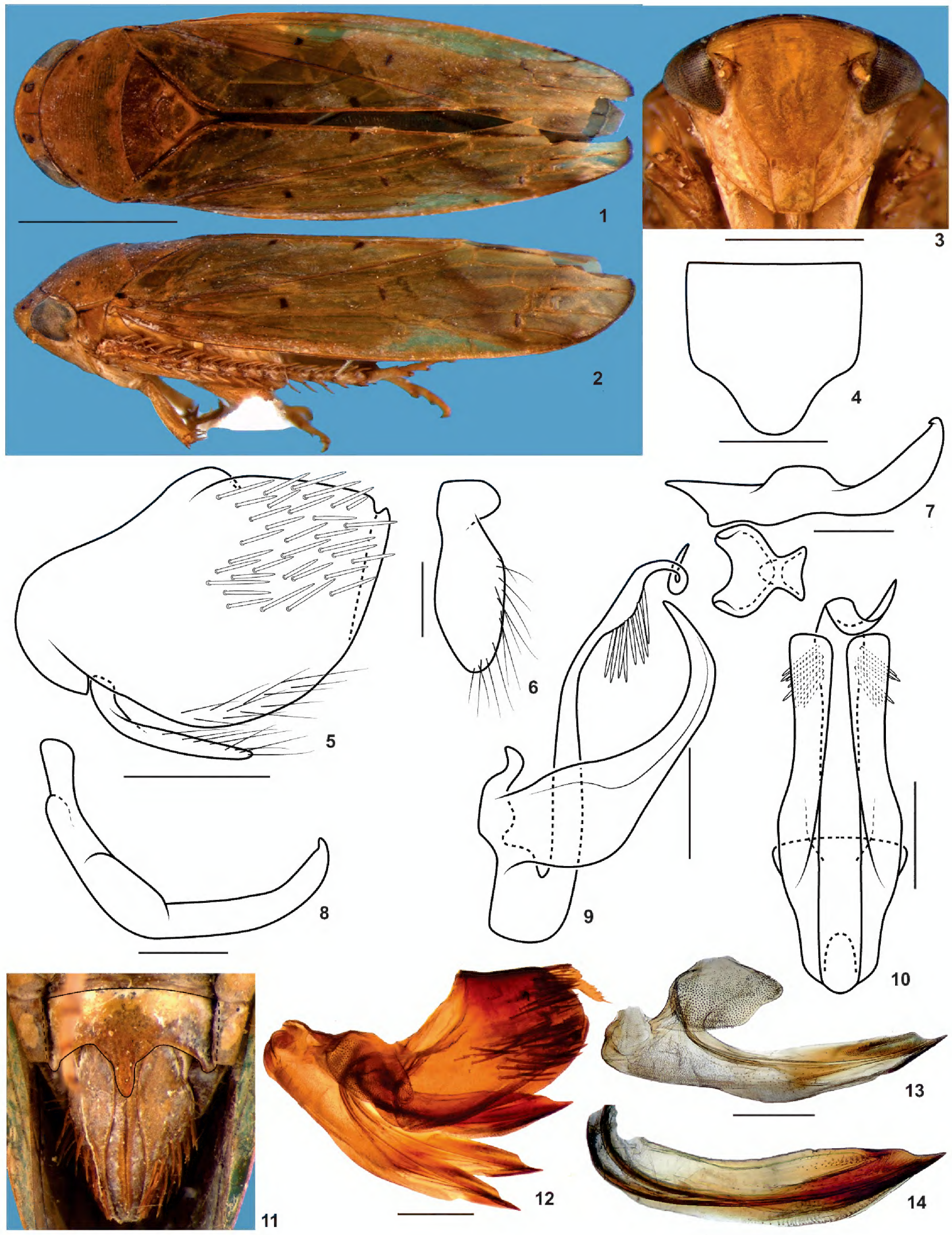
Diagnosis. Style (Fig. 8) elongated; blade with same height along entire length, ventral margin not serrated, apex slightly curved dorsally with apical tip. Aedeagal shaft (Figs 9, 10) with subapical group of eight spine-like processes on each side of shaft on ventral surface.

Description. Male length 7.1–7.6 mm, female length 7.8 mm.

Head (Fig. 1), in dorsal view, with transocular width $^{4}/_{5}$ humeral width of pronotum. Head (Fig. 2), in lateral view, with clypeus slightly inflated and frons slightly rounded. Head (Fig. 3), in frontal view, with face wider than long; clypeus as long as wide, lateral margins slightly convergent apically, apex straight; maxillary plates produced ventrally as far as clypeus apex; gena with ventrolateral margins slightly rounded; frons approximately 1.1 times longer than wide, not excavate below anterior margin of crown; frontogenal suture distant from eye margin by short distance, approximately equal to scape diameter, and reaching antennal ledges, antennal ledge carinate and transverse. Forewing (Figs 1, 2) without extra cross veins; appendix developed and involving first and second apical cells, as wide as maximum width of first apical cell. Foreleg with profemur, in frontal view, 3.5 times longer than high; profemur AV row with five or six setae and PV rows absent; protibia more or less cylindrical, with a longitudinal carina adjacent to PD row; protibia AV row formed by long setae, gradually increasing in thickness and length toward apex; AD formed by many small setae; PD row with four long setae; PV row developed, with very small setae near base and four or five long setae on apical two-thirds. Hind leg with femoral setal formula 2:2:1; metatibia AD row with intercalary setae between macrosetae; PV row with setae of apical half formed by sequence of a thicker and three thinner setae; first tarsomere with two rows of setae on plantar surface, median row distinctly smaller in length than external row; apex with four platellae; second tarsomere apex with two apical platellae. Other characteristics as in subgeneric description.

Coloration. Head and thorax (Figs 1, 2) pale brown. Crown (Fig. 1) without maculae. Face (Fig. 3) without maculae. Pronotum (Fig. 1), in dorsal view, with small rounded black spot behind each eye at one-third length of disk; in lateral view (Fig. 2), proepimeron with narrow and elongated black macula just below pronotal carina. Mesonotum without maculae. Forewings (Figs 1, 2) pale brown with brown transversal stripe on apical third and five small black spots: one on base, near humeral angle; two on clavus, on apex of each anal vein; and two on corium, on each cross vein of discal cell. Legs pale brown.

Male terminalia. Sternite VIII (Fig. 4) approximately as wide as long; posterolateral corners rounded; posterior margin with middle portion strongly produced and rounded. Pygofer (Fig. 5) about 1.4 times longer than maximum height; macrosetae dispersed on posterodorsal quadrant; dorsal margin with



Figures 1–14. *Polana* (*H.*) *alvarengai* sp. nov. (1–10) Holotype male: (1) habitus, dorsal view; (2) habitus, lateral view; (3) head, frontal view; (4–10) male terminalia: (4) sternite VIII, ventral view; (5) pygofer and subgenital plate, lateral view; (6) subgenital plate, ventral view; (7) style and connective, dorsal view; (8) style, lateral view; (9) aedeagus, lateral view; (10) aedeagus posterior view; (11–14) Paratype female: (11) apical portion of abdomen, ventral view; (12) genital capsule, lateral view; (13) first valvifer and first valvula, lateral view; (14) second valvulae, lateral view. Scale bars: 1–2 = 2.0 mm, 3, 11 = 1.0 mm, 4–5, 12–14 = 0.5 mm, 6–10 = 0.25 mm.

short basal process; ventral margin rounded and with hair-like setae; posterodorsal margin straight and with small V-shaped notch at apex; posterior margin infolded. Subgenital plate (Figs 5, 6) short, in lateral view, produced posteriorly only as far as half length of pygofer; in ventral view, approximately 2.7 times longer than wide; maximum width at mid-portion; internal margin rounded; external margin rounded and with hair-like setae; apex rounded. Connective (Fig. 7) Y-shaped, with rami as long as stalk; stalk short and wider apically, approximately as long as wide. Style (Fig. 7), in dorsal view, with outer lobe reduced and truncated; in lateral view (Fig. 8), elongated, blade with same height along entire length, ventral margin not serrated, apical third slightly curved dorsally; apex with apical tip directed dorsally. Aedeagus (Figs 9, 10) with preatrium reduced; dorsal apodeme rounded, not developed laterally; atrial processes curved dorsally, not as long as shaft apex, in lateral view, wide near base and tapered toward apex, with lateral carina, apex acute; shaft curved dorsally near base, subapical group of eight spine-like processes on each side of shaft on ventral surface; apex flat and twisted to right side.

Female terminalia. Sternite VII (Fig. 11) approximately 1.6 times wider than long; posterolateral angles rounded and produced; posterior margin deeply excavated laterad of median lobe and with apex tapered, occupying median third and distinctly produced posteriorly beyond lateral angles. Pygofer (Fig. 12) about 1.8 times longer than maximum height, apex broadly rounded; macrosetae dispersed on dorsoapical fourth and ventroapical half. Internal sternite VIII membranous. First valvifer (Fig. 13) 1.4 times higher than long; external surface with many minute setae. First valvulae (Fig. 13) slightly curved dorsally; basal portion developed anterad and truncated; apical third with dorsal sculptured area strigate; apex tapered abruptly and serrated laterally. Second valvulae (Fig. 14) with greatest height posterior to middle portion; dorsal margin without teeth; apex narrowed and acute.

Material examined. Holotype male: "Vilhena, Rondônia\Brasil XI-1960\M. Alvarenga", DZUP. Paratypes: 1♀, same data of holotype, DZUP; 1♂, "Vilhena, RO [Rondônia]\27/12/1986\C. Elias, leg.\Polonoroeste", DZUP; 2♂, "Sinop, Mato Grosso\Brasil X/1975\M. Alvarenga", DZUP; 2♂, same data, DZRJ; 2♂, same data, MNRJ; 1♂, "Jacareacanga\Pará Brasil X-1969\M. Alvarenga leg.", DZUP.

Remarks. *Polana* (*H.*) *alvarengai* sp. nov. is most similar to *P.* (*H.*) *orbita* by the very similar shape of style and the apex of aedeagal shaft recurved. However, it can be easily distinguished by the pygofer without internal processes (Fig. 5) and the aedeagal shaft with two subapical groups of eight spine-like processes (Figs 9, 10).

Etymology. The new species name is an honor of Moacir Alvarenga, Major of the Brazilian Air Force, great collector of insects, whose inestimable material, collected on decades of 1950–1980 in areas which today are degraded, is still the basis for many scientific studies.

Polana (*Hobemanella*) *arcana* sp. nov.

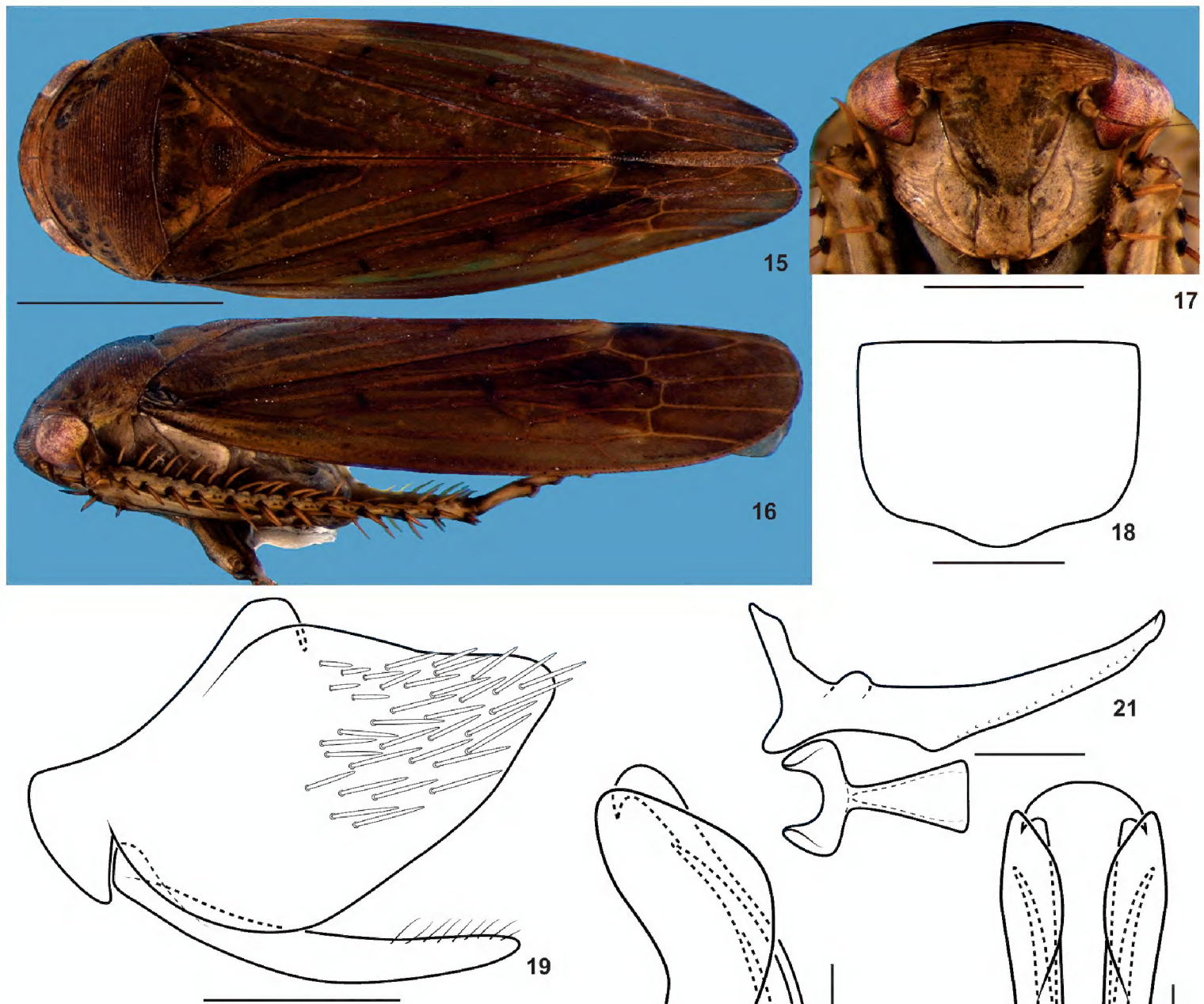
http://zoobank.org/0A54C6A7-81E9-4449-AF16-31BCBCB605CF
Figs 15–28

Diagnosis. Style (Fig. 22) elongated; blade with ventral margin produced near base and serrated. Aedeagus (Figs 23, 24) with pair of elongated processes arising at base, with acute apex, almost as long as shaft length and parallel to shaft.

Description. Male length 7.2–7.5 mm, female length 8.5–8.9 mm. Head (Fig. 17), in frontal view, with clypeus 1.1 times longer than wide, lateral margins slightly divergent apically, apex emarginated; frons approximately 1.2 times longer than wide; frontogenal suture distant from eye margin by distance two times wider than scape diameter. Head (Fig. 16), in lateral view, with clypeus not inflated and frons rounded. Forewing (Figs 15, 16) with appendix narrower than maximum width of first apical cell. Foreleg with profemur, in frontal view, 3.1 times longer than high; AV row with four or five setae and PV rows with two or three setae. Other characteristics as in the previous description.

Coloration. Head and thorax (Figs 15, 16) dark brown. Crown (Fig. 15) without maculae. Face (Fig. 17) with frons brown, clypeus, lora and genae pale brown. Pronotum and mesonotum (Figs 15, 16) without maculae. Forewings (Figs 15, 16) dark brown with veins yellowish on apical portion; five black spots: one on base, near humeral angle; two on clavus, on apex of each anal vein; and two on corium, on each cross vein of discal cell. Legs pale brown; metatibiae with cucullate bases of macrosetae black.

Male terminalia. Sternite VIII (Fig. 15) approximately 1.3 times wider than long; posterolateral corners rounded; posterior margin with middle portion slightly produced and rounded. Pygofer (Fig. 19) about 1.6 times longer than maximum height; macrosetae dispersed on apical half; dorsal margin with short basal process; ventral margin rounded, without hair-like setae; posterodorsal and posteroventral margins almost straight and convergent apically; apex rounded. Subgenital plate (Figs 19, 20) elongated, in lateral view, produced posteriorly almost as far as pygofer apex; in ventral view, approximately 3.3 times longer than wide; maximum width at mid-portion; internal margin rounded; external margin rounded and with short setae on apical half; apex rounded. Connective (Fig. 21) Y-shaped, with rami shorter than stalk; stalk elongated, narrow on base and wider apically, approximately three times longer than wide. Style (Fig. 21), in dorsal view, with outer lobe reduced and rounded, in lateral view (Fig. 22), elongated, blade with ventral margin produced near base and serrated, apex curved dorsally, narrow and rounded. Aedeagus (Figs 23, 24) with preatrium reduced; dorsal apodeme short and rounded, not developed laterally; with atrial processes bent dorsally, as long as shaft, in lateral view, narrow near base and wider on apex, apex rounded; shaft with pair of elongated processes arising at base, with acute apex, almost as long as shaft length and parallel to shaft, shaft curved dorsally, apex rounded with two short lateral processes directed basally.



Figures 15–28. *Polana* (*H.*) *arcana* sp. nov. (15–24) Holotype male: (15) habitus, dorsal view; (16) habitus, lateral view; (17) head, frontal view; (18-24) male terminalia: (18) sternite VIII, ventral view; (19) pygofer and subgenital plate, lateral view; (20) subgenital plate, ventral view; (21) style and connective, dorsal view; (22) style, lateral view; (23) aedeagus, lateral view; (24) aedeagus posterior view; (25–28) Paratype female: (25) apical portion of abdomen, ventral view; (26) genital capsule, lateral view; (27) first valvifer and first valvula, lateral view; (28) second valvulae, lateral view. Scale bars: 15–16 = 2.0 mm, 17, 25 = 1.0 mm, 18–19, 26-28 = 0.5 mm, 20–24 = 0.25 mm.

Female terminalia. Sternite VII (Fig. 25) approximately 1.6 times wider than long; posterolateral angles rounded; posterior margin slightly excavated laterally of median rounded lobe, which occupies median third and is slightly more produced posteriorly than lateral angles. Pygofer (Fig. 26) about 1.8 times longer than maximum height, apex broadly rounded; macrosetae dispersed on dorsoapical fourth and ventroapical half. Internal sternite VIII membranous. First valvifer (Fig. 27) twice higher than long; external surface without setae. First valvulae (Fig. 27) slightly curved dorsally; basal portion developed anterad and with rounded lobe; apical third with dorsal sculptured area strigate; apex tapered abruptly and serrated laterally. Second valvulae (Fig. 28) with greatest height posterior to middle portion; dorsal margin roundly excavated near mid-length and without teeth; apical portion gradually tapering to acute apex.

Material examined. Holotype male: "Brasil, Paraná, S.[São] J.[José] dos\Pinhais, 25°36'18"S\49°11'37"W 880m\01–08.iii.2014 malaise\A.C. Domahovski leg.", DZUP. Paratypes: 3♂, same data, DZUP; 3♂, same data except 09–23.ii.2012, DZUP; 1♂, 1♀, same data except 12.ii.2012, DZUP; 1♂, same data except 02–09.xii.2012, DZUP; 1♂, same data except 03–10.iv.2013, DZUP; 1♀, same data except 04–18.v.2013, DZUP; 1♂, same data except 11–14.i.2014, DZUP; 1♂, same data except 08–15.ii.2014, DZUP; 2♂, same data except 28.iii.2014, DZUP; 1♀, same data except 05.iv.2014, sweep, DZUP; 1♂, same data except 10–17.iv.2014, MZUSP; 1♂, same data except 7–21.ii.2015, MZUSP; 1♀, same data except 09.v.2015, DZUP; 1♀, same data except 18–20.iv.2015, MNRJ, 1♂, same data except 23.XII.2015, sweep, MZUSP; 1♀, same data except 09.III.2016, sweep, DZUP; 1♂, same data except 19.III.2016, sweep, MNRJ; 1♂, same data except 23.III.2016, sweep, MNRJ; 2♂, same data except 01–30.XI.2016, DZRJ; 1♂, same data except 05–12.XI.2016, DZRJ; 1♂, same data except 01–31.I.2017, DZRJ; 3♂, 1♀, same data except 25–28.II.2017, sweep, DZRJ; 2♂, 1♀, same data except 01–31.III.2017, DZUP; 1♀, same data except 08–22.IV.2017, sweep, DZUP.

Remarks. *Polana* (*H.*) *arcana* sp. nov. is similar to *P.* (*H.*) *elabora*, *P.* (*H.*) *scela* and *P.* (*H.*) *alvarengai* sp. nov. in having the pygofer without a conspicuous process as the one observed in the other species of *Hobemanella*. The new species is similar to *P.* (*H.*) *bohemani*, *P.* (*H.*) *chelata* and *P.* (*H.*) *luteonota* by the shape of style with ventral margin of blade higher near mid-portion and serrated, but differs by the ventral margin of blade higher more basally (Fig. 22) compared with the others. *Polana* (*H.*) *arcana* sp. nov. can be easily distinguished from other *Hobemanella* species by the presence of a pair of elongated processes arising at the base of aedeagal shaft (Figs 23, 24).

Etymology. The species epithet, *arcana*, comes from the Latin "arcanum" and means mystery. This name was chosen because almost all specimens were collected with malaise trap; all attempts to collect this species by sweeping the vegetation around the traps have failed. The ten specimens collected by sweeping were obtained far away from the malaise trap, approximately 500 m from it.

Key to males of *Polana* (*Hobemanella*)

1 Pygofer (DeLong and Freytag 1972: 245, figs 10, 15) with conspicuous processes 2
– Pygofer (Figs 5, 19) without processes or very reduced. 13
2 Pygofer (DeLong and Freytag 1972: 245, figs 10, 15) with processes elongated, arising from dorsal margin, near base, extending posterad to pygofer apex 3
– Pygofer (DeLong and Freytag 1972: 251, figs 52, 57) with processes with another format..... 10
3 Aedeagal shaft (DeLong and Freytag 1972: 245, figs 6, 11) with apex bifid or with apical processes (DeLong and Freytag 1972: 248, fig. 38 4
– Aedeagal shaft (DeLong and Freytag 1972: 248, figs 22, 27) with apex rounded, without processes 6
4 Aedeagal shaft (DeLong and Freytag 1972: 248, fig. 38) with long and slender apical processes like filaments..... *P. resilara* (Peru)
– Aedeagal shaft (DeLong and Freytag 1972: 245, figs 6, 11) with apex bifid forming short rami 5
5 Aedeagal shaft (DeLong and Freytag 1972: 245, fig. 6) with apex enlarged, rami apart from each other, not serrated; subgenital plates (DeLong and Freytag 1972: 245, fig. 9) four times longer than wide ..... *P. chelata* (Peru)
– Aedeagal shaft (DeLong and Freytag 1972: 245, fig. 11) with apex not enlarged, rami contiguous to each other and serrated; subgenital plates (DeLong and Freytag 1972: 245, fig. 14) three times longer than wide..... *P. resupina* (Bolivia, Peru and Venezuela)
6 Atrial processes (DeLong and Freytag 1972: 248, figs 32, 33) with a short lateral spine near apex.... *P. assula* (Peru)
– Atrial processes (DeLong and Freytag 1972: 248, figs 22, 27) without lateral spine near apex 7
7 Style (DeLong and Freytag 1972: 245, fig. 19) with ventral margin distinctly produced near mid-length of blade 8
– Style (DeLong and Freytag 1972: 248, figs 24, 29) with approximately the same height along the entire length or ventral margin slightly produced near mid-length of blade.....9
8 Style (DeLong 1979a: 158, fig. 35) elongated, ventral margin produced at mid-length of blade.*P. luteonota* (Bolivia)
– Style (DeLong and Freytag 1972: 245, fig. 19) shorter, ventral margin produced at basal third of blade ..... *P. bohemani* (Cerntal and South America)
9 Pygofer (DeLong and Freytag 1972: 248, fig. 26) with apex tapered; style (DeLong and Freytag 1972: 248, fig. 24) with approximately the same height along the entire length; atrial processes (DeLong and Freytag 1972: 248, fig. 23), in lateral view, with rounded apex... *P. alia* (Peru)
– Pygofer (DeLong and Freytag 1972: 248, fig. 31) with apex truncated; style (DeLong and Freytag 1972: 248, fig. 29) with ventral margin slightly produced near mid-length of blade; atrial processes (DeLong and Freytag 1972: 248, fig. 28), in lateral view, with broad and truncated apex..... *P. retenta* (Venezuela)
10 Pygofer (DeLong and Freytag 1972: 251, figs 47, 63) with processes arising near apex and directed ventrally..... 11
– Pygofer (DeLong and Freytag 1972: 251, fig. 57) with processes arising near mid-length and with two short points ... *P. orbita* (Bolivia and Paraguay)

11 Style (DeLong and Freytag 1972: 251, fig. 60) with ventral margin produced near mid-length of blade; aedeagal shaft (DeLong and Freytag 1972: 251, figs 58, 59) with subapical spine-like processes extending basally..... .....*P. macula* (Bolivia)
– Style (DeLong and Freytag 1972: 251, figs 45, 50) with ventral margin not produced; aedeagal shaft (DeLong and Freytag 1972: 251, figs 49, 54) without subapical processes, apex membranous and bent ventrally..... 12
12 Style (DeLong and Freytag 1972: 251, fig. 45) with apical fourth curved dorsally.....*P. celsa* (Bolívia)
– Style (DeLong and Freytag 1972: 251, fig. 50) not curved dorsally, apex with a small tip directed dorsally ....*P. chifama* (Brazil)
13 Aedeagal shaft (Figs 23, 24) with a pair of processes arising at base..... *P. arcana* sp. nov. (Brazil)
– Aedeagal shaft (DeLong and Freytag 1972: 255, figs 65, 70) without processes arising at base..... 14
14 Aedeagal shaft (Figs 9, 10) with pair of subapical groups of eight spine-like processes on ventral surface..... .....*P. alvarengai* sp. nov. (Brazil)
– Aedeagal shaft (DeLong and Freytag 1972: 255, figs 65, 70) without groups of subapical processes 15
15 Aedeagal shaft (DeLong and Freytag 1972: 255, figs 74, 75) with apical processes elongated..... .....*P. ardua* (Paraguay)
– Aedeagal shaft (DeLong 1984: 49, fig. 2) without apical processes or with very short ones, spine-like (DeLong and Freytag 1972: 255, figs 65, 70) 16
16 Aedeagal shaft (DeLong 1984: 49, fig. 2) without apical or subapical processes..... 17
– Aedeagal shaft (DeLong and Freytag 1972: 255, figs 65, 70) apical portion with apical and subapical processes very short, spine-like..... 18
17 Atrial processes (Delong 1979b: 300, fig. 22) constricted before apex.....*P. putara* (Bolivia)
– Atrial processes (Delong 19784: 49, fig. 2) without constriction before apex..... *P. belema* (Brazil)
18 Aedeagal shaft (DeLong and Freytag 1972: 255, fig. 64) with apex bifid; atrial processes (DeLong and Freytag 1972: 255, fig. 65), in lateral view, enlarged at apex ....*P. elabora* (Peru)
– Aedeagal shaft (DeLong and Freytag 1972: 255, fig. 69) with apex not bifid; atrial processes (DeLong and Freytag 1972: 255, fig. 70), in lateral view, narrow at apex..... .....*P. scela* (Peru)

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LITERATURE CITED

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